Running head: AN EXPLORATION OF PERSONALITY AND SOCIAL

An Exploration of Personality and Social Variables in College Hookah Smokers

Kendall A. Leser

The Ohio State University

Declaration

This undergraduate honors thesis is a presentation of my original research work leading to the award of Bachelor's of Arts "With Research Distinction in Psychology." I have cited and acknowledged the work of others within the text of my work. The work was done under the guidance of Dr. Lisa Cravens-Brown and Dr. Jennifer Cheavens at The Ohio State University, Columbus, Ohio.

Kendall A. Leser May 20, 2009

Acknowledgements

Firstly, I would like to thank my advisor and mentor Dr. Lisa Cravens-Brown for dedicating her time, energy and psychological knowledge to my honors thesis project—without Dr. Cravens-Brown, my thesis project would not have been possible. I would also like to thank Dr. Jennifer Cheavens for being my faculty advisor for my project. The funding for my thesis project was made possible through the grants and scholarships of The Ohio State University's College of Social and Behavioral Sciences, College of Arts and Science and Undergraduate Student Government.

Abstract

Hookah has been a part of society since the early 1700s and is now on the rise among college students in the United States. Research is scant on the psychological aspects that explain smoking hookah; therefore, the purpose of this study was to address the psychological and social variables in hookah and cigarette smokers. Introductory Psychology students (N=342) completed a demographic questionnaire, the Big Five Inventory, the Distress Tolerance Scale, and a questionnaire assessing perceptions of harm and current smoking status. Subjects identified smoking hookah as being significantly less harmful than smoking cigarettes. Both hookah and cigarette smokers emphasized the positive reinforcement values of smoking, while cigarette smokers also emphasized negative reinforcement values. No relationship was found between personality, distress tolerance and smoking status. The results of study indicate a need for educational prevention/intervention programs across college campuses, as well as a need for more research on the psychological components associated with smoking hookah.

Table of Contents

An Exploration of Personality and Social Variables in College Hookah Smokers

Smoking hookah refers to the action of heating tobacco with charcoal and then inhaling the tobacco smoke after it has passed through water contained in a pipe, also known as a waterpipe. The waterpipe device is composed of a head, a body, a bowl and a hose with a mouthpiece. The tobacco is often flavored/sweetened and is placed on the head of the waterpipe. Charcoal is placed on a piece of foil, which is then placed on top of the tobacco. The person smoking places their mouth on the mouthpiece and inhales the smoke, which has passed through the body and the bowl of water and finally up the hose (Smith-Simone, Maziak, Ward, & Eissenberg, 2008). Other terms for hookah are: shisha, narghile, and hubble-bubble (Maziak, Ward, & Eissenberg, 2004). Smoking tobacco from a waterpipe is not a new idea; it has its origins in India and the Middle East, where smoking hookah has been in practice since the early 1700s (Ward et al., 2007).

In the Middle East, the practice of smoking hookah was on the decline during most of the 20th century; however, during the 1990s it became a popular practice again (Kandela, 2000; Ward et al., 2007). In fact, recent studies have suggested that nearly 25% of people in some Middle Eastern societies smoke hookah (e.g. Maziak et al., 2004). Smoking hookah is not just on the rise in the Middle East, but in the United States as well, especially among college students (e.g. Smith-Simone et al., 2008). At least two recent studies have suggested that the prevalence of hookah smoking is notable in the college population. For example, Smith, Curbow, and Stillman (2007) noted that 15.3% of their sample of 411 college freshmen had smoked hookah in the past 30 days, while Eissenberg, Ward, Smith-Simone and Maziak (2008) found that a little over 20% of their sample of 744 Introductory Psychology students had smoked hookah in the

past 30 days. One study found that 25.9% of its sample used cigarettes and 16.4% used marijuana in addition to smoking tobacco in a waterpipe (Smith-Simone et al., 2008).

One way to examine smoking habits is to explore perceptions of harm. Although there is still very little research on hookah, studies suggest that people believe that smoking hookah is less dangerous than smoking cigarettes (e.g. Eissenberg et al., 2008). Results of one recent study showed that people who smoked hookah in the past 30 days were more likely than those who have never smoked hookah to believe that smoking hookah was less harmful than smoking cigarettes (Eissenberg et al., 2008). This same study also found that people who smoked hookah in the past 30 days believed that their peers looked "very cool" when they smoked hookah; while never-smokers generally believed that their peers looked "not cool at all" (Eissenberg et al., 2008). In this same vein, one study noted that peer influence and having a large social network was a predictor for smoking behavior in the college population (Morrell, Cohen, Bacchi, & West, 2005). A common perception is that passing the smoke through water provides a protection against the harmful effects of smoking. Ward et al. (2007) found that 67.1% of their sample believed cigarettes to be more harmful than hookah, 25.9% believed both forms to be as equally harmful, and only 7% believed that smoking hookah was more harmful than smoking cigarettes. When asked if switching from smoking cigarettes to smoking hookah would reduce health risks, 82.6% believed that health risks would decrease if cigarette smokers became hookah smokers. In addition to believing hookah is less harmful to one's health, hookah smokers also rate waterpipe as less addictive than cigarettes. For example, Eissenberg et al. (2008) found that a majority of their sample rated cigarettes as more addictive. In addition, 79.2% of this sample said that they were "very confident" in their ability to quit smoking hookah (Eissenberg et al., 2008).

It is clear from the emergent literature that perceptions of harm are considerably different for hookah than for cigarettes, such that it is common knowledge, even among smokers, that smoking cigarettes is bad for a person's health, but there is a widespread belief that smoking hookah alleviates those risks. At this point, there is little known about the health effects of solely smoking hookah, because a large percentage of people who smoke hookah also smoke cigarettes (World Health Organization, 2005). However, studies have shown that the same chemicals that lead to cancer and heart disease are seen in the tobacco used for smoking hookah (World Health Organization, 2005). Developing tuberculosis is also a known risk, because people share the mouthpieces on waterpipes (Knishkowy & Amnita, 2005). It has also been suggested that when compared to smoking cigarettes, smoking hookah may be more dangerous because it takes longer to smoke all of the tobacco in a waterpipe than to smoke a cigarette; therefore, there is a greater exposure to carbon dioxide from smoking hookah (World Health Organization, 2005). Of course, there is nicotine in the tobacco used for smoking hookah; therefore, hookah is addictive. People may believe that the smoke inhaled from a waterpipe does not contain nicotine at all, but this a misconception because the water does not absorb all of the nicotine (World Health Organization, 2005). In addition, people appear to smoke hookah with more intensity per session than they smoke cigarettes. Measurements have suggested that there is about a 500 ml puff volume for smoking one hookah pipe and only about a 40-50 ml puff volume from smoking one cigarette (Shilhadeh, Azar, Antonios, & Haddad, 2004). Thus, a person who smokes hookah may inhale as much smoke during one setting as one who smokes approximately 100 cigarettes (World Health Organization, 2005).

Previous research on smoking cigarettes has addressed the types of personality traits

associated with smoking behavior. Personality psychology's history is rooted in the idea that all important qualities of human life are labeled with words — known as the lexical hypothesis (Funder, 2007). Many researchers have looked at personality traits as lists of words, but Gordon Allport and his graduate student conducted the most extensive early research on this topic -- coming up with a list of nearly 18,000 words that described personality (Funder, 2007). Raymond Cattell used factor analysis to reduce Allport's list to 16 major traits to describe personality. Later, Fiske used this same set of 16 to generate a list of five major personality traits (Carver & Scheier, 2008). These five traits are credited as being the precursors to the well-known "Big Five:" neuroticism, extraversion, agreeableness, conscientiousness and openness (Funder, 2007).

Neuroticism is most closely related to ineffective management of stress and emotion. Common descriptors of high neuroticism are: tense, anxious, moody, and excessive worry (Funder, 2007). Research has suggested that those who score high in neuroticism are unhappy and sometimes physically ill (Funder, 2007). People high in neuroticism have a difficult time coping with the stressful events of life, have poorer relationships, and are more likely to participate in criminal behavior than those who score low in neuroticism (Funder, 2007).

People high in extraversion tend to be highly sociable (e.g. Funder, 2007; Carver & Scheier, 2008). Traits that are commonly associated with extraversion are: talkative, assertive, energetic, adventurous, outgoing, and dominant (Funder, 2007). Psychologists have been known to interpret extraversion differently—as some view extraversion as a positive trait that is correlated with happiness and ambition, while others view extraversion as a negative trait such as being impulsive or unreliable (Funder, 2007). People who score high in extraversion are viewed

as more popular than those who score low in extraversion (Funder, 2007). It has been suggested that those high in extraversion are happier and more grateful than those low in extraversion (Funder, 2007).

People who generally show a great deal of purpose in reaching their goals are high in conscientiousness (Funder, 2007). Trait descriptors for conscientiousness include: organized, thorough, efficient, and responsible (Funder, 2007). There is some controversy over the pure meaning of conscientiousness, such that some use it as a measure of self-control, whereas others think of it as the will to achieve (Funder, 2007).

Other traits included in the "Big Five" model for personality traits are agreeableness and openness. Agreeableness is most associated with the willingness to cooperate and these people are commonly described as sympathetic, friendly, kind, appreciative, and affectionate (Funder, 2007). Openness is used to describe those who are open-minded, imaginative, and clever (Funder, 2007). Because agreeableness and openness are not commonly discussed in smoking literature, these two personality traits were not examined in the present study.

Although hookah has a long cultural history, hookah as a focus of research is a relatively young topic. No published studies were found on the relationship of personality traits to hookah, or even comparing hookah smokers to cigarette smokers on such traits. However, there is a fairly substantial amount of literature on the relationship of personality to cigarette smoking. For example, research supports a clear link between the personality trait of neuroticism and cigarette smoking, such that higher levels of neuroticism predict smoking behavior (e.g., Terraciano & Costa, 2004). When smokers were compared to those who never smoked in a 2004 study, smokers scored higher on neuroticism than subjects who never smoked (Terraciano & Costa,

2004). Similarly, Byrne and Byrne (1995) found that never-smokers who remained never-smokers during the study had lower rates of neuroticism than never-smokers who became smokers or smokers who remained smokers. High levels of neuroticism have also been related to smoking onset in adolescents and continued smoking behavior in adulthood (Byrne & Byrne, 1995).

Conscientiousness has been shown to play a large role in smoking behavior as well, such that smokers have lower levels of conscientiousness than non-smokers (e.g. Terracciano & Costa 2004). Another study paired extraversion with conscientiousness and found that those high in extraversion but low in conscientiousness were more likely to smoke cigarettes and have other risky health behaviors. In contrast, those low in extraversion and high in conscientiousness were found to be the most cautious in their health behaviors (e.g. Vollrath & Torgersen, 2008). Research on the personality trait of extraversion in relationship to cigarette smoking has suggested that extraversion alone is not related to cigarette smoking; however, those who seek "extreme excitement" may tend to smoke cigarettes more than those who do not seek "extreme excitement" (e.g. Terracciano & Costa, 2004). Those who score high in both extraversion and neuroticism but low in conscientiousness have been showed to have impulsive tendencies, which can lead to risky behaviors such as cigarette smoking. High levels of conscientiousness have been shown to counter-balance the effects of those who score highly in extraversion and neuroticism in relationship to smoking (Vollrath &Torgersen, 2008).

The term distress tolerance refers to one' ability to endure negative emotional and psychological states (Simons & Gaher, 2005). Those who score low in distress tolerance are expected to view the state of distress as "unbearable" and "upsetting" and often times become

absorbed in the negative emotions that they experience (Simons & Gaher, 2005). Men are more likely to have high levels of distress tolerance when compared to women (Simons & Gaher, 2005). People low in distress tolerance are also more likely to participate in impulsive behaviors as a way to temporarily escape their negative emotions (Simons & Gaher, 2005). Hence consuming alcohol or other substances in order to cope with distress is much more likely for those low in distress tolerance (Simons & Gaher, 2005). Some interesting research has been done on the relationship of distress tolerance to smoking cessation. People low in distress tolerance are more likely to relapse than those higher in distress tolerance (Brown, Lejuez, Kahler, & Strong, 2002). Brown et al. (2002) exposed smokers who had always relapsed after quit attempts to stressful tasks in the laboratory. They found that immediate relapsers (within 24 hours of first attempting to quit) had less persistence in attempting the challenging tasks than those smokers who had delayed relapse (within three months of attempting to quit smoking). At baseline, the immediate relapsers scored lower in distress tolerance than the delayed relapsers. Thus, it can be hypothesized that those who score low in distress tolerance will be more likely to participate in risky behavior such as smoking, and it was a goal of this study to examine the relationship between hookah smoking and distress tolerance.

This study explored personality traits, harm perception, distress tolerance, and social variables related to hookah smoking. This study is important because the literature on variables related to hookah smoking is scant, although there is such literature on the variables associated with cigarette smoking. Specifically, this study examined the correlations between "Big Five" personality traits and smoking status. Based on previous smoking research, we hypothesized that hookah smokers would score higher in neuroticism and extraversion, but lower in

conscientiousness than nonsmokers; however, it was also a goal of this study to explore differences in such traits at a more specific level. Thus, hookah smokers were expected to be significantly higher than cigarette smokers in extraversion and conscientiousness, due to the perception that hookah is less harmful than cigarettes; neuroticism in both hookah smokers and cigarette smokers was expected to be higher than in nonsmokers. In order to ensure the validity of these hypotheses, we replicated the perception of harm data from previous studies (e.g. Eissenberg et al., 2008).

In past studies, cigarette smokers scored significantly higher than nonsmokers, ex-smokers, and "triers" in their expectancies about smoking, but no such data existed regarding hookah smokers and expectancies. We expected that hookah smokers would score lower than cigarette smokers on negative consequences and higher on positive reinforcement subscales. Cigarette smokers and hookah smokers were expected to be lower in their abilities to handle negative emotions than nonsmokers; however, hookah smokers were expected to be higher than cigarette smokers on distress tolerance. In previous studies, hookah smokers reported that use is most often with other people and previous research has also suggested that peer tobacco use is a strong predictor of smoking (e.g., Eissenberg et al., 2008; Morrell et al., 2005; Ward et al., 2007). We expected to find that hookah smokers use tobacco in a social context, and that smoking is seen as acceptable by hookah smokers' peers to a greater extent than by nonsmokers' peers.

Methods

Participants

Ohio State undergraduate Introductory Psychology 100 students were invited to participate in this study. Subjects did not receive any monetary compensation, but received course credit for participation in this study. There was no exclusion criterion for participation in this study, other than each participant needed to be 18 years old or older. According to an *a priori* power analysis, based on a moderate effect size (.30) and an alpha-level of 0.05, we needed at least 85 subjects total – we far exceeded this with our final sample of 342 participants.

Materials

Subjects answered several demographic questions, as well as completed questionnaires regarding current tobacco usage and patterns. Items concerning current usage and patterns were drawn from the National Center for Health Statistics website database of items from national surveys on tobacco use (see Appendix A). The scales used in this study were the Big Five Inventory (BFI), Distress Tolerance Scale (DTS) and the Short-Form Smoking Consequences Questionnaire (S-SCQ). All the measures used in this study have been shown to have good reliability and validity data. Each standardized measure is listed below with relevant reliability and validity information.

Big Five Inventory. The BFI is a measure of level of Big Five personality traits, on which participants score themselves on 44 personality descriptors on a 5-point Likert scale (see Appendix B). This measure was developed specifically for occasions for which assessment of the five dimensions is needed, but no need for fully differentiated measurement of the individual facets, making it perfect for research purposes. Reliability of this instrument is good, with alpha reliability coefficients ranging from .75-.90, with an average above .80 and test-retest reliabilities ranging from .80-.90, with an average of .85 (John & Srivastava, 1999). Validity data comparing the BFI and two other, well-established, measures of big five traits indicate good convergence, with coefficients from

.83 to .97. Confirmatory factor analysis by John and Srivastava also yielded high validity coefficients (.90-.94), suggesting that the BFI has good structural validity.

Distress Tolerance Scale. The DTS is a 15-item questionnaire that uses a 5-point Likert scale to measure the extent to which the participant is able to experience and withstand negative emotional states (see Appendix C). Four types of questions are used to measure emotional distress: tolerance, appraisal, absorption and regulation. High scores on this scale mean that the participant has a greater tolerance for emotional distress (Simons & Gaher, 2005). Simons and Gaher (2005) found evidence for good internal consistency (alpha coefficient of .89), as well as test-retest reliability (r=.61). Validity analyses in an initial and confirmatory factor analysis indicated significant correlations in the expected directions with related variables, suggesting adequate convergent, discriminant, and criterion validity.

Short-Form Smoking Consequences Questionnaire. In order to measure beliefs and expectancies regarding smoking, we will use the S-SCQ (Myers, MacPherson, McCarthy, & Brown, 2003). The S-SCQ is a 21-item measure of four facets of smoking-related beliefs (see Appendix D). Items are answered using a 7-point Likert scale ranging from "not true of me at all" to "extremely true of me." Myers, et al. found evidence for good internal consistency (alpha coefficient of .93), and good fit for the four-factor model. The short form correlated strongly (r=.94) with the longer form created by Brandon and Baker (1991), as did the individual subscales. In order to account for hookah smokers, several questions will be reworded to read "smoking" instead of "cigarette," but no other words were changed.

Procedure

Subjects were prescreened at the start of the quarter for their smoking status. All students,

regardless of smoking status were eligible to participate; however, in order to achieve an adequate number of cigarette and hookah smokers for analysis, hookah and cigarettes smokers were differentially recruited for this study.

The risk to the subjects in this experiment was minimal, other than being asked to describe their smoking habits and general questions about personality traits, there was no risk of harm or negative emotions. At worst, students may have felt somewhat bored spending 30 minutes answering the questions. Eligible participants were contacted by email and offered an opportunity to sign up for our study on the Research Experience Program course-specific website. Research personnel checked these sign-ups on a daily basis and emailed participants to ask them to complete a web-based survey. Once participants signed up, an email was sent to confirm the study appointment time and participants were provided a URL to a web-based survey posted on SurveyMonkey.com. This website provided researchers with an opportunity to run surveys on-line and collect data. All data was SSL-encrypted, and stored on servers installed with firewall software that were physically locked and required a passcard and biometric recognition to enter. In order to assure that students who participated received credit for their participation, each student was given a unique identifier by Survey Monkey. Research personnel gave credit to each student within 72 hours after participation. All evidence that related the student's name to the study was destroyed, thus removing any link between identifying information and the data.

Participation took approximately 30 minutes and was completed online, (from any computer with Internet access). The decision to allow subjects to participate online was based on past Ohio State University researchers' experiences with administering questionnaires online. Study procedures and the elements of consent were presented initially and the subject clicked a button to

indicate they had understood the material and agreed to participate in the survey. Subjects then completed the questionnaires and answered demographic information. On every page of the survey, there was a button that allowed the subject to exit the survey, thus ensuring their ability to withdraw without penalty at any time. Students who choose to withdraw without completing the survey were still given credit for their participation. After pressing the "Done" button at the end of the survey, subjects were presented with a debriefing form that included smoking cessation resource information for any student who may have desired it.

Results

Characteristics of prescreening sample. Three hundred and twelve Introductory Psychology students were a part of this randomized prescreening sample. Of the entire sample, 167 were female (54%), 144 were males (46%) and the mean age was 19.4 years.

Prescreening sample. Results showed that 13.8% of the prescreening sample had smoked hookah in the past 30 days, while 17.3% had smoked cigarettes in the past 30 days. Of this sample, 28% of subjects who had smoked hookah in the past 30 days labeled themselves as smokers, while 41% of subjects who has smoked cigarettes in the past 30 days labeled themselves as smokers.

Characteristics of study sample. Three hundred forty two participants took part in the study (147 [43%] men; 195 [57%] women). The mean age for the entire sample was 20.07 years. The majority of the sample were Caucasian (74%), followed by Asian (9.40%), mixed race/other (6.50%), Middle Eastern (6.10%) and African American (3.80%). The majority of the sample were freshman (60.5%), followed by sophomores (26.6%), juniors (7.60%) and seniors (4.70%). The majority of participants (67.30%), lived on Ohio State's campus, while 24% lived in

apartments, 6.1% lived with parents, and 2.2% lived elsewhere.

Smoking status. Of the entire sample, 177 participants (51.80%) had ever smoked a cigarette and 165 (48.20%) had never smoked a cigarette. Of those who had ever smoked a cigarette, 69 (38.98%) had smoked more than 100 cigarettes in their lifetime. Of the entire sample, 194 participants (56.70) had smoked hookah in their lifetime, while 147 (43%) had not ever smoked hookah. Of the entire sample, 186 participants (54.40%) had ever visited a hookah bar, while 155 (45.30%) had not. As seen in Figure 1, in the past 30 days, 23.40% of participants who had smoked hookah at least once in their lifetime, had not smoked hookah; 18.70% smoked hookah on one day, 9.40% smoked hookah on two/three days, 2.30% smoked hookah between four and six days and 3.30% smoked hookah seven or more days. Of the entire sample, 62 (18.10%) of participants had ever used smokeless tobacco products, while 278 (81.30%) had never used smokeless tobacco or did not know if they had. At the time of the study, three participants (0.90%) were using smokeless tobacco products every day, ten (2.90%) used smokeless tobacco on some days, and 328 (95.90%) were not using smokeless tobacco at all or did not know if they were using smokeless tobacco. Of the entire sample, 44 participants (12.90%) had ever smoked a cigar, 292 (85.40%) had never smoked a cigar, and five participants (1.50%) did not know if they had ever smoked a cigar. At the time of the study, 45 participants (13.20%) were using cigars on some days, 290 (84.80%) were not using cigars at all, and six (1.80%) did not know if they were using a cigar or not.

Personality—Big Five Traits. Results from the study sample yielded no relationship between smoking status and the personality traits of extraversion and neuroticism or their

interactions (please see Table 1). Results for extraversion and neuroticism in relationship to smoking status is as follows: extraversion ($r_{hookah\ 30\ days}$ = .016, p=.829; $r_{cig\ 30\ days}$= -.018, p=.814) and neuroticism ($r_{hookah\ 30\ days}$ =.075, p=.302; $r_{cig\ 30\ days}$=-.40, p=.598). There was, however, a weak relationship between having smoked hookah in the past 30 days and conscientiousness ($r_{hookah\ 30\ days}$ = -.150, $p < .05$). There was no relationship between conscientiousness and cigarettes smoking ($r_{cig\ 30\ days}$=-.050, p=.511).

Distress Tolerance. Results from the study sample (please see Table 2) showed that there was no relationship between smoking status and distress tolerance ($r_{hookah\ 30\ days}$ =.093, p=.195; $r_{cig\ 30\ days}$=-.044, p=.564). Overall, women were lower in distress tolerance (t=3.91, p<.001). Smokers with lower levels of distress tolerance rated smoking as having a negatively reinforcing value (r=-.188, p<.05).

Smoking Consequences. Results (please see Table 3) indicated that both hookah and cigarette smokers rated smoking as having a positively reinforcing value ($F_{hookah\ 30\ days}$ =4.477, p<.05; $F_{cig\ 30\ days}$=13.18, p<.001). However, only cigarette smokers (please see Table 4) ranked smoking as having a negative reinforcing value ($F_{cig\ 30\ days}$=29.92, p<.001). Cigarette smoking was positively associated with negative consequences, such as negative health outcomes (r=.176, p<.05) and weight loss consequences (r=-.261, p<.001), but these relationships were nonsignificant for hookah smoking.

Perception of Harm. Of the entire study sample, as seen in Figure 2, 50.9% stated that hookah was less harmful than cigarettes, 37.3% said hookah was equally as harmful and 11.8% said that hookah was more harmful than cigarettes. As seen in Figure 3, results indicated that 22.9%

believed that there was no likelihood of becoming addicted to hookah, 48.2% believed that there was a "low" likelihood, 22.9% believed that there was a "medium" likelihood and 5.9% believed that there was a "high" likelihood of becoming addicted to hookah. Of the entire sample, 82.5% believed that it was more likely to become addicted to cigarettes than hookah, 16.4% thought that both were equally addictive and 1.2% thought that hookah was more addictive than cigarettes. In addition, 36.9% of smokers indicated they used hookah during a previous quit attempt from cigarettes (11.3% switched to smokeless tobacco, 2.4% used a nicotine replacement and 56.5% used nothing).

Social Variables. Of the entire sample, 86.2% said that their friends/peers smoked, but only 11.6% had a mother who smoked; 19.6% had a father who smoked, and 16.7% had a sibling who smoked. Results indicated that 44.5% of subjects stated that their peers found hookah smoking to being "very acceptable," 38.5% stated their peers found it to be "somewhat acceptable," 10.3% found it to be "somewhat unacceptable" and only 6.8% said their peers found hookah smoking to be "not acceptable." Of the entire study sample, 73.7% of those who had smoked hookah first did so between the ages of 16 and 18; 88% of those who ever smoked hookah did so in a group of friends their first time. Ten percent smoked hookah with one or more person; no one smoked alone their first time. Smoking hookah was positively correlated with a larger percentage of friends who smoked ($r_{\text{hookah 30 days}}$=.179, p<.05); while cigarette smoking was negatively correlated with the percentage of friends who smoked ($r_{\text{cig 30 days}}$= -.327, p<.001).

Discussion

This present study is the first of its kind to examine the relationships between personality,

distress tolerance and the positive/negative reinforcing values of smoking in college hookah smokers. Past studies have, however, explored the perceptions of harm associated with smoking hookah and have suggested that people generally believe that smoking hookah is less harmful than smoking cigarettes (Eissenberg et al., 2008). The present study's findings on the perceptions of harm associated with hookah smoking are consistent with the past literature. Exploring the psychological components and perceptions of harm associated with hookah smoking is becoming an important field of research because the act of smoking hookah is on the rise across United States college campuses (Smith-Simone et al., 2008). Prior to running the study, randomized prescreening data was collected on whether or not Introductory Psychology students had used any form of tobacco in the past 30 days. Results of this prescreening study indicated that 13.8% of the sample had smoked hookah in the past 30 days, which is consistent with past research (e.g. Smith et al, 2007). This finding suggests the growing importance of hookah research.

Because the literature on hookah smoking in relationship to personality traits is nonexistent, hypotheses for the present study were made based on past cigarette smoking and personality literature. The hypothesis was made that both cigarette and hookah smokers would rank lower in conscientiousness than non-smokers, but that hookah smokers would rank higher in conscientiousness than cigarette smokers (due to the belief that hookah smoking is less harmful than cigarette smoking). Results indicated that there was a weak significant correlation between hookah smoking and conscientiousness; however, the results indicated that hookah smokers were less conscientious than the rest of the sample—therefore, the hypothesis was rejected. One possible explanation for this finding could be that the subjects participated in the study during the first three weeks of a ten-week academic quarter. This potentially suggests that

those who completed the study, regardless of smoking status, already ranked high in conscientiousness because people who score high in conscientiousness tend to be organized and achieve their goals (Funder, 2007). Another hypothesis regarding personality and smoking status was that hookah smokers would rank higher in extraversion than cigarette smokers and non-smokers because smoking hookah is viewed as being a sociable event. However, results indicated no significant relationship between extraversion and smoking status. One possible explanation for the lack of relationship between smoking status and extraversion was that the mean average of extraversion was higher in the present study's sample than the normative sample. Perhaps a reason why the present study's sample had such high levels of extraversion was due to the fact that hookah smokers were differentially recruited for the study and were all included in the sample. In addition, it is quite possible that hookah smokers do not differ all that much in this construct than cigarette smokers, and past literature has not consistently found that extraversion predicts cigarette smoking.

Past research has indicated that neuroticism is positively correlated with smoking cigarettes (Terraciano & Costa, 2004). Therefore, it made sense to explore the hypothesis that both hookah and cigarette smokers would rank higher in neuroticism than nonsmokers. However, no relationship was found between neuroticism and smoking status. Perhaps hookah smokers simply do not have neurotic tendencies. However, because cigarette smokers did not rank as having significant levels of neuroticism, as past research has suggested, the instrument used to measure neuroticism (the Big Five Inventory) may not have been strong enough. In the future, a finer-tuned measure of personality, such as the NEO-Five Factor Inventory, should be used to measure personality.

One of the most intriguing findings of this study was the difference between the smoking expectancies of hookah and cigarette smokers. Hookah smokers and cigarette smokers both highlighted the positive reinforcing values of smoking. Cigarette smokers also rated smoking as being negatively reinforcing and having negative consequences, while hookah smokers did not. These findings confirm the original hypothesis that hookah smokers would rank smoking as having fewer negative consequences than cigarette smokers. Because hookah smokers do not associate smoking hookah with negative consequences, it can be suggested that hookah smokers do not perceive the act of smoking hookah to be harmful to their well-being; this finding was mirrored in our harm perception data as well.

Past research has shown a relationship between distress tolerance and risky behaviors (e.g. cigarette smoking), such that those low in distress tolerance are more likely to participate in risky/impulsive behaviors in order to immediately cope with stress (Simons & Gaher, 2005). Based on previous studies on distress tolerance, it was hypothesized that cigarette smokers and hookah smokers would score lower on distress tolerance than non-smokers, but that hookah smokers would score higher in distress tolerance than cigarette smokers. However, results from the present study indicated that there was no relationship between smoking status and distress tolerance. However, there was a relationship between the negative reinforcing value of smoking and distress tolerance, such that those who rated smoking as having a negative reinforcing value scored lower in distress tolerance. This finding makes sense based on the previous literature, because people low in distress tolerance attempt to find methods to cope with and take away their stress/anxiety (Simons & Gaher, 2005). Therefore, if subjects in the present study were currently smoking, they may not have perceived themselves has having low levels of distress

tolerance, which serves as a possible explanation for why there was not a relationship between distress tolerance and smoking status in the study.

The present study explored the subjects' perceptions of harm associated with smoking hookah and the results were consistent with the past literature on the topic, such that subjects ranked smoking hookah as being less harmful/addictive than smoking cigarettes. Nearly 40% of subjects who had tried to quit smoking cigarettes switched to smoking hookah as a method of smoking cessation, suggesting that people find hookah to be less harmful than cigarettes. Subjects also stated that their peers found smoking hookah to be much more acceptable than smoking cigarettes. All subjects also stated that when they smoked hookah the first time, they did so with friends and no one stated that they smoked hookah alone their fist time. People who had smoked hookah in the past 30 days actually had a greater percentage of friends who smoked. This finding is consistent with previous literature and confirms the hypothesis that peer tobacco is a predictor of smoking (Eissenberg et al., 2008; Ward et al, 2008). On the other hand, people who had smoked at least 100 cigarettes in their lifetime had a significantly lower percentage of friends who smoked.

The perception of harm findings and social variables associated with smoking hookah suggest a need for the development of prevention/intervention educational programs. These programs should be aimed towards college students, especially freshmen, because a large percentage of students start smoking hookah their freshman year. The content of these educational programs should emphasize that smoking hookah is not good for ones' health--as the tobacco from smoking hookah contains the same toxins that cause lung cancer and heart disease (World Health Organization, 2005). Another aspect that educational programs should

concentrate on is the fact that the tobacco in hookah smoking contains nicotine. This is a common misconception, due to the belief that *all* or most of the nicotine gets filtered out through the waterpipe, when in fact it does not. Therefore, there is a risk of becoming addicted to smoking hookah (World Health Organization, 2005). In fact, people may even smoke hookah for longer periods of time in order to satisfy their craving for nicotine (World Health Organization, 2005). Therefore, educational programs should emphasize that smoking hookah is not a safe alternative to smoking cigarettes. Educational programs could also focus on intervening on the positive reinforcement values of smoking hookah and emphasize that even though smoking hookah may be a positive experience, harm to one's health still can occur.

There were some limitations to this study. Firstly, subjects were differentially recruited based on their smoking status to participate in the study, this serves as a limitation when determining the prevalence of smoking in the population; however, researchers did conduct a randomized prescreening study which addressed the prevalence of smoking. Secondly, the instruments used to assess personality and distress tolerance should include a greater amount of questions in order to collect a wider spectrum of information on the subjects' personalities and distress tolerance levels. Finally, the use of Survey Monkey may also have served as a limitation to the study, because researchers could not observe subjects as they took the study; therefore, it was difficult to monitor how seriously subjects took their participation in the study. However, Survey Monkey did allow for mass data collection and the study had 98.84% completion rate, mostly likely due to the fact that subjects could take part in the study from the comfort of their own homes.

In all, more research needs to be conducted on hookah smoking and the reasons why

people smoke hookah. Even though personality and distress tolerance were not correlated with hookah smoking in the present study, these results are truly preliminary and much more research should be conducted on personality variables that may predict smoking behaviors, as well as distinguishing between smoking populations. Future research could also examine the relationship between smoking hookah and marijuana usage, as well as risky sexual behaviors. There is also a need for specialized group studies in hookah bars and places such as fraternity houses, in order to better understand the social variables associated with smoking hookah. There is clearly enough evidence to suggest a need for hookah smoking educational programs and these programs should be evaluated based on college students' smoking status after being educated on the harms of smoking hookah. With the increased usage of hookah in today's U.S. college population, continued research in the fields of Psychology and Public Health is a must in order to better understand why people choose to smoke hookah, even when research suggests that there are hazardous health risks associated with smoking hookah.

References

Brandon, T. H., & Baker, B. (1991). The Smoking Consequences Questionnaire: The subjective expected utility of smoking in college students. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *3*(3), 484-491.

Brown, R. A., Lejuez, C. W., Kahler, C. W., & Strong, D. R. (2002). Distress tolerance and duration of past smoking cessation attempts. *Journal of Abnormal Psychology*, *111*(1), 180-185.

Byrne, D. G., Byrne, A. E., & Reinhart, M. I. (1995). Personality, stress and the decision to commence cigarette smoking in adolescence. *Journal of Psychosomatic Research*, *39*(1), 53-62.

Carver, C.S. & Scheier, M.F. (2008). *Perspectives on Personality* (6th ed.). Boston, MA: Pearson Education.

Eissenberg, T., Ward, K. D., Smith-Simone, S., & Maziak, W. (2008). Waterpipe tobacco smoking on a U.S. college campus: Prevalence and correlates. *Journal of Adolescent Health*, *42*(5), 526-529.

Funder, D.C. (2007). *The Personality Puzzle* (4th ed.). New York, NY: W.W. Norton &Company.

John, O. & Srivastava, S. (1999). The Big Five Trait taxonomy: History, measurement, and theoretical perspectives. In Pervin, L., & John, O.P. (Eds.), *Handbook of personality: Theory and research.* New York: Guilford.

Kandela, P. (2000). Nargile smoking keeps arabs in wonderland. *Lancet,*

356(9236), 1175.

Knishkowy, B., & Amitai, Y. (2005). Water-pipe (narghile) smoking: an emerging health risk behavior. *Pediatrics*, *116*(1), 113-9.

Maziak, W., Ward, K. D., & Eissenberg, T. (2004). Factors related to frequency of narghile (waterpipe) use: The first insights on tobacco dependence in narghile users. *Drug and Alcohol Dependence*, *76*(1), 101-106.

Morrell, H. E., Cohen, L., Bacchi, D., & West, J. (2005). Predictors of smoking and smokeless tobacco use in college students: a preliminary study using web-based survey methodology. *Journal of American college health : J of ACH*, *54*(2), 108-115.

Myers, M. G., MacPherson, L., McCarthy, D. M., & Brown, S. A. (2003). Constructing a short form of the Smoking Consequences Questionnaire with adolescents and young adults. *Psychological Assessment*, *15*(2), 163-172.

National Center for Health Statistics (2009). *Questionnaires, data sets, and related documentation*. Retrieved August 10, 2008, from Centers for Disease Control Web site: http://www.cdc.gov/nchs/about/major/nhis/quest_data_related_1997_forward.htm

Shihadeh, A., Azar, S., Antonios, C., & Haddad, A. (2004). Towards a topographical model of narghile water-pipe cafe smoking: A pilot study in a high socioeconomic status neighborhood of Beirut, Lebanon. *Pharmacology, Biochemistry and Behavior*, *79*(1), 75-82.

Simons, J. S., & Gaher, M. (2005). The distress tolerance scale: Development and validation of a self-report measure. *Motivation and Emotion*, *29*(2), 83-102.

Smith, S. Y., Curbow, B., & Stillman, F. A. (2007). Harm perception of nicotine products in

college freshmen. *Nicotine & Tobacco Research*, *9*(9), 977-982.

Smith-Simone, S., Maziak, W., Ward, K. D., & Eissenberg, T. (2008). Waterpipe tobacco smoking: Knowledge, attitudes, beliefs, and behavior in two U.S. samples. *Nicotine & Tobacco Research*, *10*(2), 393-398.

Terracciano, A., & Costa, T. (2004). Smoking and the Five-Factor Model of personality. *Addiction*, *99*(4), 472-481.

Vollrath, M. E., & Torgersen, S. (2008). Personality types and risky health behaviors in Norwegian students. *Scandinavian Journal of Psychology*, *49*(3), 287-292.

Ward, K. D., Eissenberg, T., Gray, J. N., Srinivas, V., Wilson, N., & Maziak, W. (2007). Characteristics of U.S. waterpipe users: A preliminary report. *Nicotine & Tobacco Research*, *9*(12), 1339-1346.

World Health Organization. (2005). Advisory note: Waterpipe tobacco smoking: Health effects, research needs and recommended actions by regulators. *WHO Study Group on Tobacco Product Regulation, 1-7.*

Appendix A

Demographic & Usage Questionnaire

Gender:

- Male
- Female
- Other

Age:

_____ yrs _____ months

Ethnicity:

- African American
- Arctic (Siberian, Eskimo)
- Asian
- Caucasian (European)
- Caucasian (Middle Eastern)
- Native American
- Mixed Race
- Other
-

Where do you live?

- On campus
- Apartment/shared housing
- With parents
- Sorority/Fraternity housing
- Other
-

What is your class rank?

- 1st year/Freshman
- 2nd year/Sophomore
- 3rd year/Junior
- 4th year/Senior
- 5th year/Senior

Are you a member of a sorority or fraternity?

- Yes
- No

Smoking Questions

1. Have you ever smoked a cigarette?
   - Yes
   - No

If No, please go to question 10; if Yes, please continue with question 2

2. Have you smoked at least 100 cigarettes in your ENTIRE LIFE? (Please note 5 packs=100 cigarettes)
   - Yes
   - No
   - Don't know

3. How old were you when you FIRST started to smoke fairly regularly?
   - Under 10 years
   - 11-15 years
   - 16-20 years
   - 21 years or older

4. Do you now smoke cigarettes every day, some days, or not at all?
   - Everyday
   - Some days
   - Not at all
   - Don't know

5. On how many of the PAST 30 DAYS did you smoke a cigarette?
   - None
   - 1-7days
   - 8-14 days
   - 15-21 days
   - 21+ days
   - Don't know

6. On average, when you smoked during the PAST 30 DAYS, about how many cigarettes did you smoke a day?
   - None
   - 1-2
   - 2-5
   - 6-9
   - 10+

7. During the PAST 12 MONTHS, have you stopped smoking for more than one day or longer because you were trying to quit smoking?
   - Yes
   - No
   - Don't know

8. How long did you go without smoking, before you started smoking again?
   - I have quit smoking
   - 0 days
   - 1-3 days
   - 4-6 days
   - 1 week
   - More than one week
   - 1 month
   - More than a month

9. During your attempt to quit smoking, what other tobacco products did you use? (Check all that apply)
   - Hookah
   - Smokeless tobacco
   - Nicotine replacement (e.g. chewing gum, the patch, etc.)
   - Other
   - None

10. Please check all that apply
    - Your mom smokes
    - Your dad smokes
    - Your siblings smoke
    - Your friends/peers smoke
    - Your best friend smokes

11. What percent of your friends smoke?
    - Under 5%
    - 6-25%
    - 26-50%
    - 51-75%
    - More than 75%

12. Have you ever used or tried smokeless tobacco products such as chewing tobacco, snuff, or snus?
    - Yes
    - No
    - Don't know

NOTE: Snus (Swedish for snuff) is a moist smokeless tobacco, usually sold in small pouches that

are placed under the lip against the gum.

13. Do you currently use chewing tobacco, snuff, or snus every day, some days, or not at all?
    - Every day
    - Some days
    - Not at all
    - Don't know

14. Do you currently use cigars, pipes, bidis, kreteks or other tobacco products? Do not include cigarettes, snus, snuff, or chewing tobacco.
    - Yes
    - No
    - Don't know

NOTE: Bidis are small, brown, hand-rolled cigarettes from India and other Southeast Asian countries. Kreteks are clove cigarettes made in Indonesia that contain clove extract and tobacco.

15. Do you currently use cigars, pipes, bidis, or kreteks every day, some days, or not at all?
    - Every day
    - Some days
    - Not at all
    - Don't know
    -

16. Have you ever visited a hookah bar?
    - Yes
    - No

17. Have you ever smoked hookah?
    - Yes
    - No

If No, please go to question 21; if Yes, please proceed to question 18.

18. At what age did you start smoking hookah?
    - 15 years or younger
    - 16 -18 years
    - 19+ years

19. When you first smoked hookah, who did you smoke with?
    - I smoked alone
    - I smoked with a friend
    - I smoked with a group of friends
    - I smoked with a family member

- Other

20. How many days out of the PAST 30 days have you smoked hookah?
    - I have not smoked hookah in the past 30 days
    - 1 day
    - 2-3 days
    - 4-6 days
    - 7-14 days
    - 15-21 days
    - 22+ days

21. How acceptable do your peers find smoking hookah?
    - Not acceptable
    - Somewhat unacceptable
    - Somewhat acceptable
    - Very acceptable

22. Compared to smoking a cigarette, how harmful is smoking hookah?
    - Less harmful
    - More harmful
    - Equally harmful

23. In your opinion, what is the likelihood of getting addicted to hookah?
    - None
    - Low
    - Medium
    - High

24. In your opinion, which is more likely?
    - Becoming addicted to hookah
    - Becoming addicted to cigarettes
    - They are equally addictive

Appendix B

Big-Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend times with others? Please write a number, listed below, next to each statement to indicate the extent to which you agree or disagree with that statement.

1. Disagree strongly

2. Disagree a little

3. Neither disagree or agree

4. Agree a little

5.Agree strongly

I see Myself as Someone Who…

____1. Is talkative

____2. Tends to find fault with others

____3. Does a thorough job

____4. Is depressed, blue

____5. Is original, comes up with new ideas

____6. Is reserved

____7. Is helpful and unselfish with others

____8. Can be somewhat careless

____9. Is relaxed, handles stress well

____10. Is curious about many different things

____11. Is full of energy

____12. Starts quarrels with others

____13. Is a reliable worker

____14. Can be tense

____15. Is ingenious, a deep thinker

____16. Generates a lot of enthusiasm

____17. Has a forgiving nature

____18. Tends to be disorganized

____19. Worries a lot

____20. Has an active imagination

____21. Tends to be quiet

____22. Is generally trusting

____23. Tends to be lazy

____24. Is emotionally stable, not easily upset

____25. Is inventive

____26. Has an assertive personality

____27. Can be cold and aloof

____28. Preservers until the task is finished

____29. Can be moody

____30. Values artistic, aesthetic experiences

____31. Is sometimes shy, inhibited

____32. Is considerate and kind to almost everyone

____33. Does things efficiently

____34. Remains calm in tense situations

____35. Prefers work that is routine

____36. Is outgoing, sociable

____37. Is sometimes rude to others

____38. Makes plans and follows through with them

____39. Gets nervous easily

____40. Likes to reflect, play with ideas

____41. Has few artistic interests

____42. Likes to cooperate with others

____43. Is easily distracted

____44. Is sophisticated in art, music, or literature

BFI scale scoring ("R" denotes reverse-scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36

Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42

Conscientiousness: 3, 8R, 13, 18R, 28, 33, 38, 43R

Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39

Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Appendix C

Distress Tolerance Scale (DTS SCALE)

Directions: Think of times that you feel distressed or upset. Select the statement below that best describes your beliefs about feeling distressed or upset.

1. Strong agree
2. Mildly agree
3. Agee and disagree equally
4. Mildly disagree
5. Strongly disagree

---

1. Feeling distressed or upset is unbearable to me.
2. When I feel distressed or upset, all I can think about is how bad I feel.
3. I can't handle feeling distressed or upset.
4. My feelings of distress are so intense that they completely take over.
5. There's nothing worse than feeling distressed or upset.
6. I can tolerate being distressed or upset as well as most people.
7. My feelings of distress or being upset are not acceptable.
8. I'll do anything to avoid feeing distressed or upset.
9. Other people seem to be able to tolerate feeling distressed or upset better than I can.
10. Being distressed or upset is always a major ordeal for me.
11. I am ashamed of myself when I feel distressed or upset.
12. My feelings of distress or being upset scare me.
13. I'll do anything to stop feeling distressed or upset.
14. When I feel distressed or upset, I must do something about it immediately.
15. When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels.

APPENDIX D

Short-Smoking Consequences Questionnaire (S-SCQ)

This is answered on a 7 point Likert scale from 1- 'not true of me at all' to 7- extremely true of me'.

1. The more I smoke, the more I risk my health
2. Smoking is hazardous to my health
3. By smoking I risk heart disease and lung cancer
4. Smoking is taking years off my life
5. When I smoke, the taste is pleasant
6. I will enjoy the flavor of smoking
7. I enjoy the taste sensations of smoking
8. Smoking tastes good
9. I enjoy feeling smoke on my tongue and lips
10. When I'm angry smoking can calm me down
11. Smoking helps me deal with anger
12. Smoking helps me deal with anxiety or worry
13. Smoking calms me down when I feel nervous
14. Smoking helps me deal with depression
15. Smoking helps me reduce or handle tension
16. When I'm upset with someone, smoking helps me cope
17. Smoking helps me control my weight
18. Smoking keeps my weight down
19. Smoking keeps me from eating more than I should
20. Smoking controls my appetite
21. Smoking keeps me from overeating

Table 1.

Correlations between smoking status and personality traits

	Extraversion	Neuroticism	Conscientiousness
Hookah 30 Days	r=.016 *p*=.829	r=.075 p=.302	r=-.150 p<.05
Cigarettes 30 Days	r=-.018 p=.814	r=.-40 p=.598	r=-.050 p=.511

Table 2

Correlations between smoking status and distress tolerance level

	Distress Tolerance
Hookah 30 Days	r=.093 *p*=.195
Cigarette 30 Days	r=-.044 *p*=.564

Table 3.

ANOVA Positive Reinforcement in relationship to smoking status over the past 30 days

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1595.035	3	531.678	6.548	.000
Intercept	39060.110	1	39060.110	481.064	.000
Yes vs No Hookah 30 Days	385.172	1	385.172	4.744	.031*
Cigs Yes vs No	1070.156	1	1070.156	13.180	.000*
Yes vs No Hookah 30days * Cigs Yes vs No	79.929	1	79.929	.984	.323
Error	10717.781	132	81.195		
Total	61219.000	136			
Corrected Total	12312.816	135			

*=significant

Table 4.

ANOVA Negative Reinforcement in relationship to smoking status over the past 30 days

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	4829.965	3	1609.988	11.525	.000
Intercept	72229.589	1	72229.589	517.049	.000
Yes vs No Hookah 30 Days	109.633	1	109.633	.785	.377
Cigs Yes vs No	4179.328	1	4179.328	29.917	.000*
Yes vs No Hookah 30days * Cigs Yes vs No	34.288	1	34.288	.245	.621
Error	18579.539	133	139.696		
Total	118271.000	137			
Corrected Total	23409.504	136			

*=significant

Figure Captions

Figure 1: Percentage of days hookah smokers smoked hookah in the past 30 days.

Figure 2: Perceptions of harm comparing the harm of hookah to cigarettes.

Figure 3: Perceptions of the addictiveness of hookah.

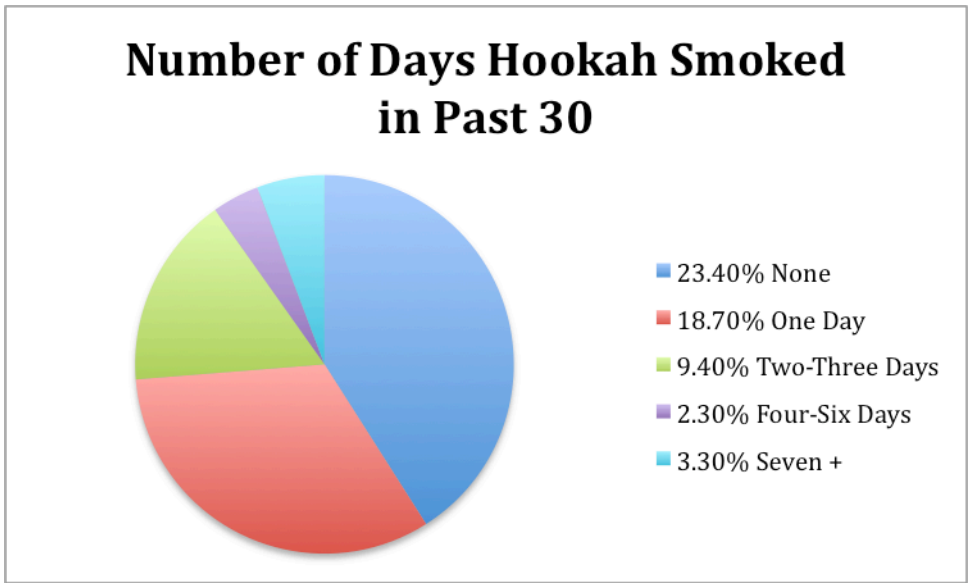

Figure 1

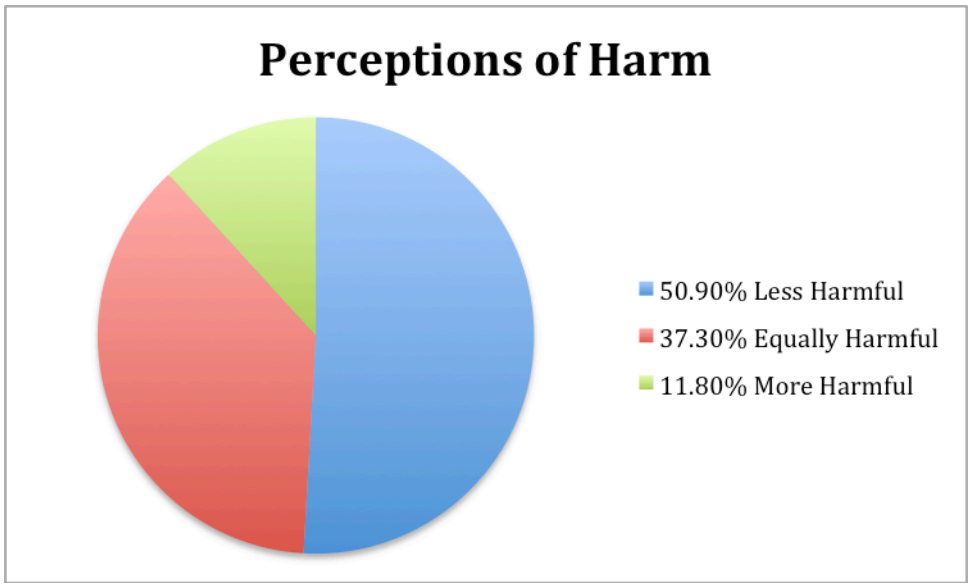

Figure 2

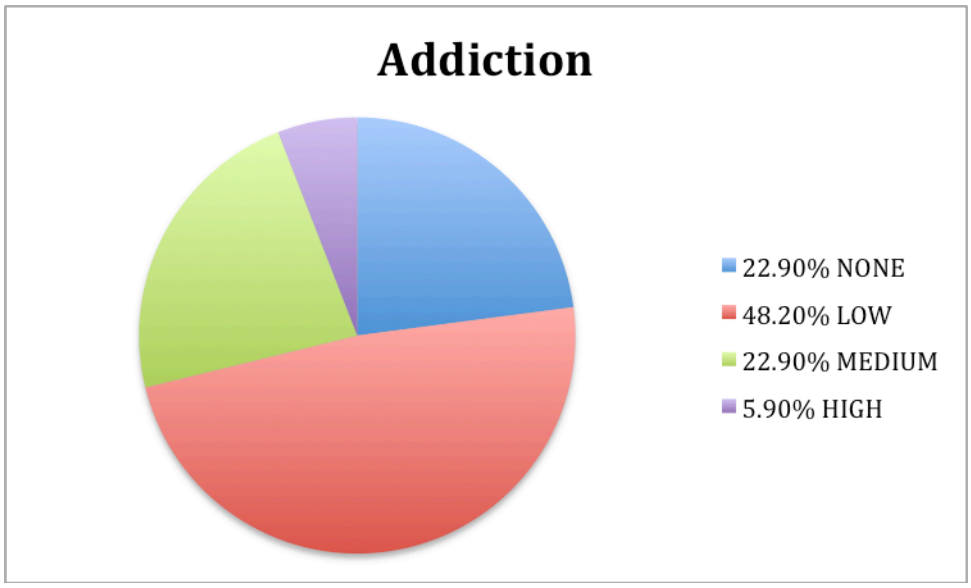

Figure 3